AMENDMENTS TO THE CLAIMS

1. (Withdrawn) A radio frequency (RF) applicator comprising an antenna body having a longitudinal axis and an outer surface defining a plurality of slots substantially parallel to one another and substantially perpendicular to the longitudinal axis.

2. (Withdrawn) The RF applicator of claim 1, wherein the antenna body is tapered along the longitudinal axis.

3. (Withdrawn) The RF applicator of claim 1, wherein:

the antenna body has a length; and

the outer surface defines the plurality of slots along substantially the entire length of the antenna body.

4. (Withdrawn) The RF applicator of claim 1, wherein the antenna body comprises a plurality of faces forming a quadrilateral cross-section.

5. (Withdrawn) The RF applicator of claim 4, wherein the slots are defined by each of two parallel faces.

6. (Withdrawn) The RF applicator of claim 4, wherein the plurality of faces form a rectangular cross-section.

7. (Withdrawn) The RF applicator of claim 1, wherein the antenna body

comprises two walls formed from an RF opaque material.

8. (Withdrawn) The RF applicator of claim 1, wherein the walls are formed from aluminum.

9. (Withdrawn) The RF applicator of claim 1, wherein the antenna body is formed from aluminum.

10. (Withdrawn) The RF applicator of claim 1, further comprising:

an RF transparent window arrangement disposed proximate the outer surface of the antenna body and arranged to cover the plurality of slots; and

an antenna enclosure formed proximate the antenna body to substantially seal the antenna body from an environment external to the RF applicator.

11. (Withdrawn) The RF applicator of claim 10, wherein the RF transparent window arrangement comprises a plurality of RF transparent windows formed from a material having a low dielectric constant.

12. (Withdrawn) The RF applicator of claim 11, wherein the RF transparent windows are formed from a material selected from the group consisting of fiberglass and TEFLON® polytetrafluoroethylene.

13. (Withdrawn) The RF applicator of claim 10, wherein the antenna enclosure is formed from a material having a low dielectric constant.

14. (Withdrawn) The RF applicator of claim 13, wherein the antenna enclosure is formed from a material having a similar dielectric constant relative to a material forming the RF transparent window arrangement.

15. (Withdrawn) The RF applicator of claim 13, wherein the antenna enclosure is formed from fiberglass.

16. (Withdrawn) The RF applicator of claim 1, wherein:

the antenna body comprises first and second ends; and

a waveguide is coupled to the first end of the antenna body.

17. (Withdrawn) The RF applicator of claim 16, further comprising a cap coupled to the second end of the antenna body.

18. (Withdrawn) The RF applicator of claim 17, wherein the cap is arranged to reflect an RF signal propagated within the antenna body to generate constructive interference.

19. (Withdrawn) The RF applicator of claim 16, wherein the cap is formed from aluminum.

20. (Currently amended) A demulsification arrangement to remove a microwave-absorptive material from a substrate, the demulsification arrangement comprising:

a containment structure <u>defining a treatment volume and</u> adaptable to receive an

emulsion comprising the microwave-absorptive material and the substrate;

a power source; and

a radio frequency (RF) applicator operatively coupled to the power source and positioned within the containment structure to deliver microwave energy into the treatment volume, the RF applicator comprising an antenna body having a longitudinal axis and an outer surface defining a plurality of slots substantially parallel to one another and substantially perpendicular to the longitudinal axis;

whereby, when the containment structure contains the emulsion and the applicator delivers the microwave energy into the treatment volume, the microwave-absorptive material and the substrate are demulsified.

21. (Original) The demulsification arrangement of claim 20, wherein the antenna body is tapered along the longitudinal axis.

22. (Original) The demulsification arrangement of claim 20, wherein:

the antenna body has a length; and

the outer surface defines the plurality of slots along substantially the entire length of the antenna body.

23. (Original) The demulsification arrangement of claim 20, wherein the antenna body comprises a plurality of faces forming a rectangular cross-section.

24. (Original) The demulsification arrangement of claim 23, wherein the slots are defined by each of two parallel faces.

25. (Original) The demulsification arrangement of claim 20, wherein the antenna body comprises two walls formed from an RF opaque material.

26. (Original) The demulsification arrangement of claim 25, wherein the walls are formed from aluminum.

27. (Original) The demulsification arrangement of claim 20, wherein the antenna body is formed from aluminum.

28. (Original) The demulsification arrangement of claim 20, wherein the RF applicator further comprises:

an RF transparent window arrangement disposed proximate the outer surface of the antenna body and arranged to cover the plurality of slots; and

an antenna enclosure formed proximate the antenna body to substantially seal the antenna body from an environment external to the RF applicator.

29. (Original) The demulsification arrangement of claim 28, wherein the RF transparent window arrangement comprises a plurality of RF transparent windows formed from a material having a low dielectric constant.

30. (Original) The demulsification arrangement of claim 29, wherein the RF transparent windows are formed from a material selected from the group consisting of fiberglass and TEFLON® polytetrafluoroethylene.

31. (Original) The demulsification arrangement of claim 28, wherein the

antenna enclosure is formed from a material having a low dielectric constant.

32. (Original) The demulsification arrangement of claim 31, wherein the antenna enclosure is formed from a material having a similar dielectric constant relative to a material forming the RF transparent window arrangement.

33. (Original) The demulsification arrangement of claim 31, wherein the antenna enclosure is formed from fiberglass.

34. (Original) The demulsification arrangement of claim 20, wherein:

the antenna body comprises first and second ends; and

a waveguide is coupled to the first end of the antenna body.

35. (Original) The demulsification arrangement of claim 34, wherein the RF applicator further comprises a cap coupled to the second end of the antenna body.

36. (Original) The demulsification arrangement of claim 35, wherein the cap is arranged to reflect an RF signal propagated within the antenna body to generate constructive interference.

37. (Original) The demulsification arrangement of claim 35, wherein the cap is formed from aluminum.

38. (Currently amended) The demulsification arrangement of claim 20, further comprising an RF generator operatively coupled to the antenna body and to the

power source and configured to generate the microwave energy.

39. (Original) The demulsification arrangement of claim 38, further comprising a control arrangement operatively coupled to the RF generator.

40. (Original) The demulsification arrangement of claim 20, further comprising an outlet port formed on the container.

41. (Original) The demulsification arrangement of claim 20, wherein the microwave-absorptive material comprises a hydrocarbon.

42. (Original) The demulsification arrangement of claim 20, wherein the substrate comprises water.

43. (Original) A demulsification arrangement comprising:

a power source;

a radio frequency (RF) generator operatively coupled to the power source and configured to generate an RF signal;

a control arrangement configured to be operatively coupled to the RF generator to control generation of the RF signal; and

a radio frequency (RF) applicator configured to be operatively coupled to the RF generator, the RF applicator being positioned within a treatment volume containing an emulsion comprising a microwave-absorptive material and a substrate to transmit the RF signal, the RF applicator comprising an antenna body having a longitudinal axis and an outer surface defining a plurality of slots substantially parallel to one another and

substantially perpendicular to the longitudinal axis;

whereby, when the control arrangement, the RF applicator, and the RF generator are operatively coupled and the RF applicator transmits the RF signal into the treatment volume, the microwave-absorptive material and the substrate are demulsified.

44. (Original) The demulsification arrangement of claim 43, wherein the antenna body is tapered along the longitudinal axis.

45. (Original) The demulsification arrangement of claim 43, wherein:

the antenna body has a length; and

the outer surface defines the plurality of slots along substantially the entire length of the antenna body.

46. (Original) The demulsification arrangement of claim 43, wherein the antenna body comprises a plurality of faces forming a rectangular cross-section.

47. (Original) The demulsification arrangement of claim 46, wherein the slots are defined by each of two parallel faces.

48. (Original) The demulsification arrangement of claim 43, wherein the antenna body comprises two walls formed from an RF opaque material.

49. (Original) The demulsification arrangement of claim 48, wherein the walls are formed from aluminum.

50. (Original) The demulsification arrangement of claim 43, wherein the antenna body is formed from aluminum.

51. (Original) The demulsification arrangement of claim 43, wherein the RF applicator further comprises:

an RF transparent window arrangement disposed proximate the outer surface of the antenna body and arranged to cover the plurality of slots; and

an antenna enclosure formed proximate the antenna body to substantially seal the antenna body from an environment external to the RF applicator.

52. (Original) The demulsification arrangement of claim 51, wherein the RF transparent window arrangement comprises a plurality of RF transparent windows formed from a material having a low dielectric constant.

53. (Original) The demulsification arrangement of claim 52, wherein the RF transparent windows are formed from a material selected from the group consisting of fiberglass and TEFLON® polytetrafluoroethylene.

54. (Original) The demulsification arrangement of claim 51, wherein the antenna enclosure is formed from a material having a low dielectric constant.

55. (Original) The demulsification arrangement of claim 54, wherein the antenna enclosure is formed from a material having a similar dielectric constant relative to a material forming the RF transparent window arrangement.

56. (Original) The demulsification arrangement of claim 54, wherein the antenna enclosure is formed from fiberglass.

57. (Original) The demulsification arrangement of claim 43, wherein:

the antenna body comprises first and second ends; and

a waveguide is coupled to the first end of the antenna body.

58. (Original) The demulsification arrangement of claim 57, wherein the RF applicator further comprises a cap coupled to the second end of the antenna body.

59. (Original) The demulsification arrangement of claim 58, wherein the cap is arranged to reflect an RF signal propagated within the antenna body to generate constructive interference.

60. (Original) The demulsification arrangement of claim 59, wherein the cap is formed from aluminum.

61. (Original) The demulsification arrangement of claim 43, wherein the microwave-absorptive material comprises a hydrocarbon.

62. (Original) The demulsification arrangement of claim 43, wherein the substrate comprises water.

63. (Original) The demulsification arrangement of claim 43, wherein the treatment volume comprises one of an underground treatment volume and an above-ground contained treatment volume.

64. (Original) The demulsification arrangement of claim 63, wherein the above-ground contained treatment volume comprises a container to receive the emulsion, the container having at least one outlet port defined by a wall of the container.